FROM:
Northern States Power Company
Minneapolis, Minn. 55401
L.O. Mayer

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Dr. Peter A. Morris

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Ltr submitted as a follow-up report to the MSIV items in report on Main Isolation Valve Problems dtd 11-26-71....

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REMARKS:

1 CY LOCAL PDR MINNEAPOLIS, MINN.
HOLDING 16 CYS FOR ACRS

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326 (8-60)

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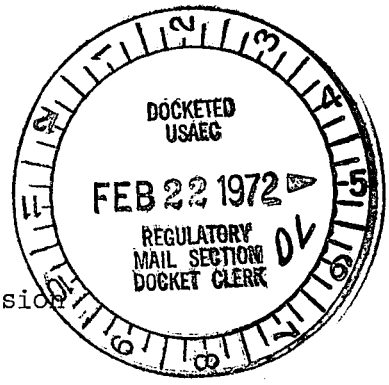
NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401

February 18, 1972



Dr. Peter A Morris, Director
Division of Reactor Licensing
United States Atomic Energy Commission
Washington, D C 20545

Dear Dr. Morris:

MONTICELLO NUCLEAR GENERATING PLANT

Docket No. 50-263 License No. DPR-22
Follow-up Report on Main Steam Isolation Valve Problem

This report is submitted as a follow-up report to the MSIV items described in the "Report on Main Steam Isolation Valve Problems," dated November 26, 1971.

Subsequent to November 26, all of the Main Steam Line Isolation Valves were leak tested in accordance with approved procedures and maintenance was performed on the valves where necessary. The following is a summary of the leak test results prior to performing maintenance on the valves:

AO 2-80A	0.2 SCFH	A02-86A	$\geq$70 gpm H_2O
AO 2-80B	0.6 SCFH	A02-86B	150.0 SCFH
AO 2-80C	1.1 SCFH	A02-86C	6.7 SCFH
AO 2-80D	153.9 SCFH	A02-86D	83.1 SCFH

It is noted that four of the eight MSIV's were leaking in excess of the 11.5 SCFH Technical Specification leakage limit.

Maintenance work on the valves extended from November 23 until January 16. During the repair period, it was necessary to disassemble two of the four MSIV's three times and one of the four MSIV's twice to reduce the leakage rates to within the allowable limit. Problems of interest encountered during the repair period included:

a. Main Poppet Guide Wear

As noted in the November 26 report, an inspection of AO 2-86A performed on November 23 revealed that one of the three poppet guides showed excessive wear on the lower 1 inch of guide material. There was also indication on the side of the main poppet of wear between this guide and the poppet. Wear on the guide and poppet was caused either by foreign

rates leads us to believe that the Main Steam Isolation Valves can reliably perform their function. It is our intent to retest the MSIV's during the next scheduled plant outage.

The November 26 report also discussed the slow closure of AO 2-80B. It was noted that AO 2-80B would close slowly only if the valve was opened and immediately reclosed. It is believed that this characteristic may have been caused by a slight contraction of the spool sleeve due to a cooling effect of the air as it passes through the sleeve when the MSIV is opened. This contraction would prevent the spool piece from responding rapidly if the MSIV is immediately given a closed signal after it has been opened.

A Significant Operating Event report has been written for this occurrence and will be available to the Region III Compliance Inspector for review during his next visit.

Yours very truly,

L. O. Mayer

L O Mayer, P.E.
Director-Nuclear Support Services

LOM/DDA/bjr

cc: B H Grier

matter which became wedged between the guide and the poppet or by foreign matter which became lodged under the seat during flushing operations allowing the poppet to vibrate freely back and forth against the guide ribs. The wear area of the poppet guide was overlayed with stellite. The poppet was rotated prior to reassembly to provide a new mating surface between the poppet and the guides. This or similar effects were not present on any other valves which were inspected.

b. Spring Collar Tack Weld Failures

Each MSIV has a pilot spring seat collar which is screwed to the stem. Each collar is tack welded to the stem to impede rotation. One of the MSIV's which was disassembled had two pilot spring collar tack welds of which one was found to be cracked. The other three MSIV's which were disassembled had only one pilot spring collar tack weld and each was cracked. On AO 2-86B the collar had unscrewed 13/32 inch. An investigation of this problem revealed that the pilot spring collar could not completely disengage from the stem because of the physical assembly of the MSIV. It was concluded that the tack weld failure problem could not prevent an MSIV from closing, however, if a high differential pressure existed across the MSIV, the MSIV could possibly not be opened if the tack weld had failed and the pilot spring collar had unscrewed to the point at which the pilot valve (which equalizes the pressure) would not open. The Monticello Operations Committee and Safety Audit Committee concluded that it was not a safety problem if an MSIV could not be opened.

The original tack welds were made using 410 stainless steel which is a hardenable material. This material loses its ductility when hardened. Since the collar and stem cannot move after the tack weld is applied, the tack weld would have a tendancy to build up internal stresses as it cools which may have resulted in a cracking of the welds. The only mechanical loading applied to the weld would be that of a slight turning moment caused by the spring deflection.

The tack welds on the four MSIV's were replaced with longer welds made with 309 stainless steel which is an austenitic material. An austenitic material will retain its ductility when heat treated and therefore should not crack as readily as the 410 stainless steel previously used for the tack welds.

c. Pilot Valve Scratches During Reassembly

As noted previously, it was necessary to disassemble three of the MSIV's more than one time to correct the leakage problem. One of the reasons for this was that the pilot valve was being scratched during the reassembly of the valve. It was found that upper edges of the pilot valve guides were very sharp and unless extreme caution is taken during the reassembly, the pilot valve would get scratched. The upper edges of the guides were chamferred and the assembly procedures were modified to minimize the possibility of scratching the pilot valve.

d. Lapping Experience

The first MSIV which was disassembled was lapped using the valve poppet as recommended by the manufacturer's representative. This proved to be unsatisfactory due to the problems with handling the poppet (the poppet weighs approximately 600 pounds). The poppet would tendto ride low in the seat regardless of how carefully it was shimmed. Subsequent valves were lapped using a steel lapping mandrel; however, the mandrel also tended to ride low in the seat. A guided cast iron lap is presently being designed for lapping main seats. During the valve maintenance, lapping tools were fabricated for lapping the pilot valve plug and seat and various rigging tools were fabricated to facilitate future valve maintenance.

The following is a summary of the major problems found with each of the four MSIV's which were leaking excessively and the corrective actions taken:

AO 2-86A

In addition to the wear observed on the guide and main poppet, as noted in the November 26 report, it was found that there was a chip out of the main seat and the valve was not seating over 25% of the seating circumference. It was also found that the upper guide land of the main poppet was out of round by as much as 20 mils. The wear area of the poppet guide was overlayed with stellite. The main seat and poppet were lapped and a truing cut was made on the upper guide land. A leak rate test performed following completion of the maintenance work indicated the valve was leaking 9.4 SCFH which is within the allowable Technical Specification limits.

AO 2-86B

The 150 SCFH leakage for this valve is attributed to scratches found on the pilot valve. The pilot valve and seat were lapped. A leak rate test performed following completion of the maintenance work indicated that the valve was leaking 3.9 SCFH.

AO 2-80D

Inspection of this valve revealed that there was a chip out of the main seat. The main seat was lapped. A leak rate test performed following completion of the maintenance work indicated the valve was leaking less than 0.2 SCFH.

AO 2-86D

The leakage through AO 2-86D is attributed to a large scratch on the pilot valve. The pilot valve and seat were lapped. A leak rate test performed following completion of the maintenance work indicated the valve leaking less than 0.2 SCFH.

It is noted that this was the first time the MSIV's were leak tested since initial plant operation. The fact that four of the eight MSIV's had low leakage